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Akio Nagasaka

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EXAMINER

LE, BRIAN Q

ART UNIT

PAPER NUMBER

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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

## Office Action Summary

**Application No.**

10/026,711

**Applicant(s)**

NAGASAKA ET AL.

**Examiner**

Brian Q. Le

**Art Unit**

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --.

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 07/12/2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-19 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date 05/15/2007.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_.

***Continued Examination Under 37 CFR 1.114***

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 07/12/2007 has been entered.

**Response to Amendment and Arguments**

2. Applicant's amendment filed July 12, 2007, has been entered and made of record.
3. Applicant's arguments with regard to claims 1, 2-4, 7-8, 11-14, 16 and 18-19 have been fully considered, but are not considered persuasive because of the following reasons:

Regarding claim 1, the Applicant argues (page 9 of the Remarks) Ohya does not teach a step of "comparing the first image feature with the second image feature to determine a level of similarity therebetween without breaking down the first and second image features into separate characters". The Examiner respectfully disagrees. First, after consideration of cited portions of specification and drawings (Page 16, 2<sup>nd</sup> paragraph, FIGs. 6-7, 9, and 11) for the support of the amended limitation, nowhere of these locations or throughout the specifications show the amended limitation "comparing the first image feature with the second image feature to determine a level of similarity therebetween **without breaking down the first and second image features into separate characters.**" (emphasis added) In contrast, the specification further discloses the extracting of (that is breaking down) characters regions (page 9, second paragraph; page 11, lines 5-11; page 14, first paragraph) for comparison (page 16, first paragraph).

The Examiner believes that all the arguments of the Applicant have been properly addressed and explained. Thus, the rejections of all of the claims are maintained.

***Claim Rejections - 35 USC § 112***

4. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

5. Claims 1-19 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Regarding independent claims 1, 7, and 11, there is no support in the original specification found for the amended limitation “comparing the first image feature with the second image feature to determine a level of similarity therebetween **without breaking down the first and second image features into separate characters.**” (emphasis added). Appropriate correction is required.

Other claims are rejected because of their dependence to the independent claims.

6. Claims 1-19 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. Regarding independent claims 1, 7, and 11, the original specification does not show of how one skilled in the art to

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compare image features after extraction to determine a level of similarity without breaking down the first and second image features into separate characters. Appropriate correction is required.

Other claims are rejected because of their dependence to the independent claims.

***Claim Rejections - 35 USC § 103***

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 1, 2-4, 7-8, 11-14, 16, and 18-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ohya et al. "Recognizing characters in scene images", I.E.E.E. Pattern Analysis and Machine Intelligence, Volume 16, Issue 2, Pages 214-220, and further in view of Bauer et al. U.S. Patent No. 6,751,603.

Regarding claim 1, Ohya teaches a method for searching at least one character image embedded in an image (abstract), comprising:

providing a first image (the process of generating images would including providing a first image) (abstract);

detecting a character region in the first image (the detection of various images would include the detection of first image) (page 215, second column, first paragraph) based upon a shape thereof (FIG. 1-FIG. 3);

extracting a first feature of the character region (FIG. 2, region number = 1);

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providing a character string of interest (FIG. 1-FIG.3);  
extracting a second feature from the second image (FIG. 2, region number = 2);  
comparing the first image feature with the second image feature to determine a level of similarity (page 215, second column, first paragraph and page 217, first column); and  
outputting the character region or the input first image comprising the character region with based on the level of similarity (FIG. 4).

However, Ohya does not explicitly teach a generation of an image of said character string of interest. Bauer further teaches a method of processing document and searching string image (abstract and column 5, lines 45-57) wherein generating an image (pictures are images) (column 5, lines 43-47) of said character string of interest by a user ("In particular, the method results in the suggestion of an individual data file name based on a character or character string input by the user" at column 2, lines 32-35). Modifying Ohya's method of method of searching for character string image according to Bauer would be able to user to receive interested character string from user. This would improve processing because it would help user to identify picture file in plurality of files rapidly by a search string(abstract, first 2 lines) and therefore, it would have been obvious to one of the ordinary skill in the art to modify Ohya according to Bauer.

Regarding claim 2, Ohya teaches the display or both high level of similar and low level of similarity (page 217, first column). However, Ohya does not explicitly teach the method for searching character image in an image, wherein at the step of outputting said character region outputs character regions in the descending order of the level of similarity. The Examiner takes Office Notice that it would have been obvious to one skilled in the art that the level of similarity can be output at the descending or ascending order as a conventional displaying order. This

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type of output (descending/ascending) output would have been obvious to one of the ordinary skilled in the art to organize the output data/level of similarity.

Regarding claim 3, Ohya teaches the method for searching at least one character string image in an image wherein the step of detecting said character region involves extracting equi-luminance pixel strings each of which has luminance differences from a background in a pre-designated range has a length of a pre-designated extent (the detection and extraction of character if pixels of the detected character have similar pixel values which are different from the background pixels values) (FIG. 1-FIG.3 and page 215).

For claim 4, Ohya teaches the method for searching at least one character string image in an image wherein the step of detecting said character region involves extracting equi-luminance pixel strings, each of which has a length equal to or longer than a pre-designated length in both vertical and horizontal directions and has a luminance difference from a background within a pre-designed range in both of the vertical and horizontal directions (the detection and extraction of character if pixels of the detected character have similar pixel values which are different from the background pixels values) (FIG. 1-FIG.3 and page 215).

For claim 7, please refer back to claim 1 for the teaching. In addition, Ohya teaches a mean for detecting a character region from the frame of the entered image on the basis of its shape (FIG. 1-3). And an output means for outputting as the result of search the character region matching the visual features in respect of which the level of similarity has been determined or a frame of image containing the region (page 215; FIG. 1-4 and page 217, first column, first paragraph). \

For claim 8, please refer back to claim 2 for further teachings and explanations.

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For claim 11, please refer back to claims 1 and 7 for further teachings and explanations.

Regarding claim 12, Ohya discloses the method whereby the step of detecting said character region includes extracting lines width a width in a specific range and extracting a concentrated region of the extracted lines as said character region (FIG. 1, FIG. 2 and page 216, B. Detecting Character Candidate Regions).

For claim 13, please refer back to claims 3 and 4 for the teachings and explanations.

For claim 14, Ohya also discloses the method whereby the line width is taken in vertical and horizontal directions (FIG. 1 and FIG. 2).

Regarding claim 16, Ohya further teaches the program wherein the module for detecting said character region extracts a character image feature string along one dimension of the character region (the extraction/segmentation by either vertical or horizontal direction and thus along one dimension of character region (page 215, column 2, A. Image Segmentation Using Local Thresholding, first paragraph; FIG. 2 and FIG. 3)).

Regarding claim 18, Ohya discloses the method further comprising a step of removing non-character background in the image by outlining the character region with a rectangle box having a sufficient margin, then removing pixels outside of the rectangle box, and wherein the output step outputs the character with the rectangle box (FIG. 2; FIG. 3; page 216 and page 218).

For claim 19, please refer back to claim 18 for the teachings.



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9. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Ohya et al. "Recognizing characters in scene images", I.E.E.E. Pattern Analysis and Machine Intelligence, Volume 16, Issue 2, Pages 214-220 and Bauer et al. U.S. Patent No. 6,751,603, as described in claim 11-14, and further in view of Akira et al. "A method for recognizing character strings from maps using linguistic knowledge.", I.E.E.E. 1993, pages: 561-564.

Regarding claim 15, Ohya does not explicitly teach the concept of concentrated region is decided by projections of the lines in the vertical and horizontal directions. However, Akira teaches a method of searching/recognition of character image embedded in an image (character from maps of various figures) (abstract) wherein concentrated region (pixel density) is decided by projections (multiplying pixels) of the lines in the vertical and horizontal directions (page 562, first column, 3.1 Character Candidates Extraction). Modifying Ohya's method of searching character image embedded in an image according to Akira would be able to one of the ordinary skilled in the art to determine the concentration of the image region by projection of the lines (multiplying pixels) in the x direction with a pixel number in the y direction. This would improve processing and therefore, it would have been obvious to one of the ordinary skill in the art to modify Ohya according to Akira.

***Allowable Subject Matter***

10. Claims 5-6, 9-10 and 17 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 1st paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

11. Regarding claims 5-6, and 10, there is no prior art found to teach the limitations “...feature to be extracted are one-dimensional feature strings whose numbers of edges in a vertical direction are obtained by binarizing luminance of each pixel and counting numbers of luminance changes in the character regions, when the character strings are arrayed horizontally...” (claims 5 and 10); “... feature to be extracted are one-dimensional feature strings whose numbers of edges in a horizontal direction are obtained by binarizing luminance of each pixel and counting numbers of luminance changes in the character regions, when the character strings are arrayed vertically ...” (claim 6); “...extracts equi-luminance pixels strings each of which has a length equal to or longer than a pre-designated length and has a luminance difference from a background within a pre-designated range.” (claim 9) and “... a module for removing line border blurring by correcting a border pixel luminance value into a maximum or minimum luminance value into a maximum or minimum luminance value of adjacent pixels” (claim 17).

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**Contact Information**

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brian Q. Le whose telephone number is 571-272-7424. The examiner can normally be reached on 8:30 A.M - 5:30 P.M.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew Bella can be reached on 571-272-7778. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Brian Le  
August 21, 2007